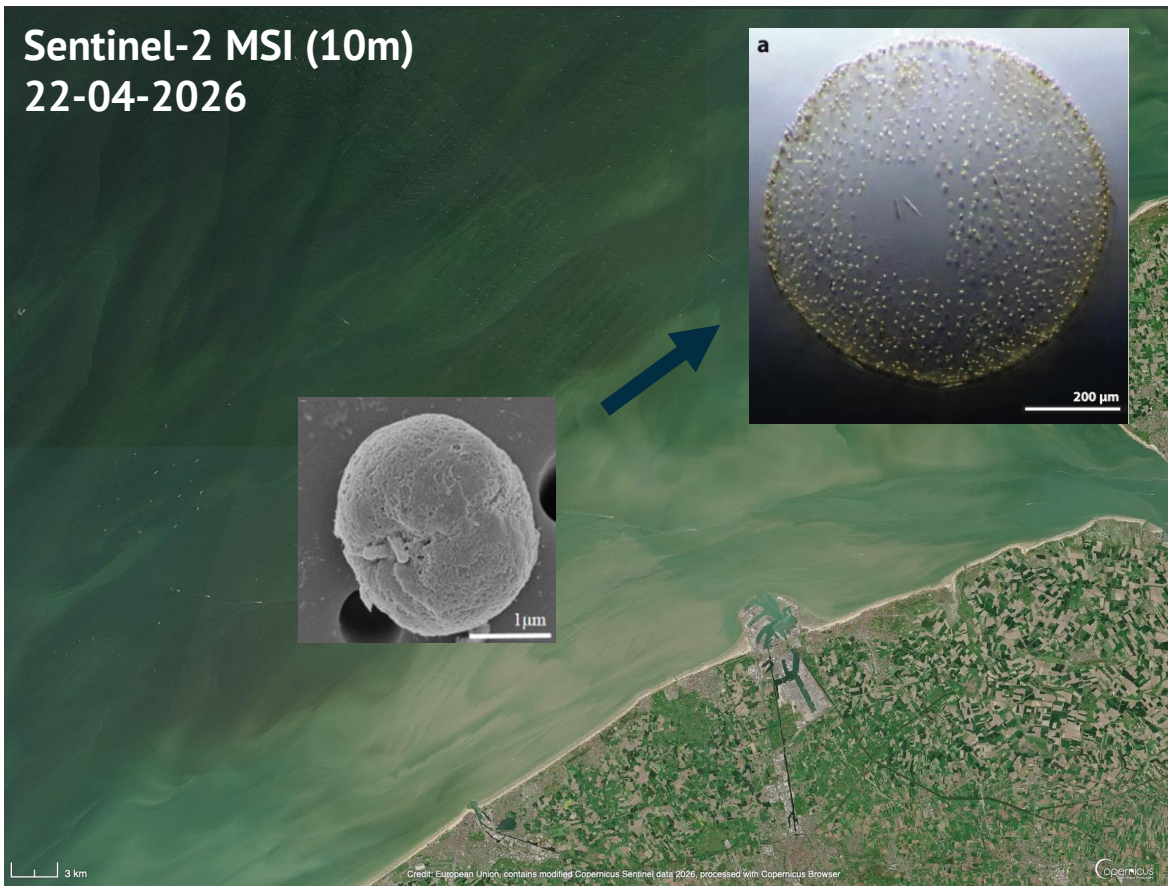


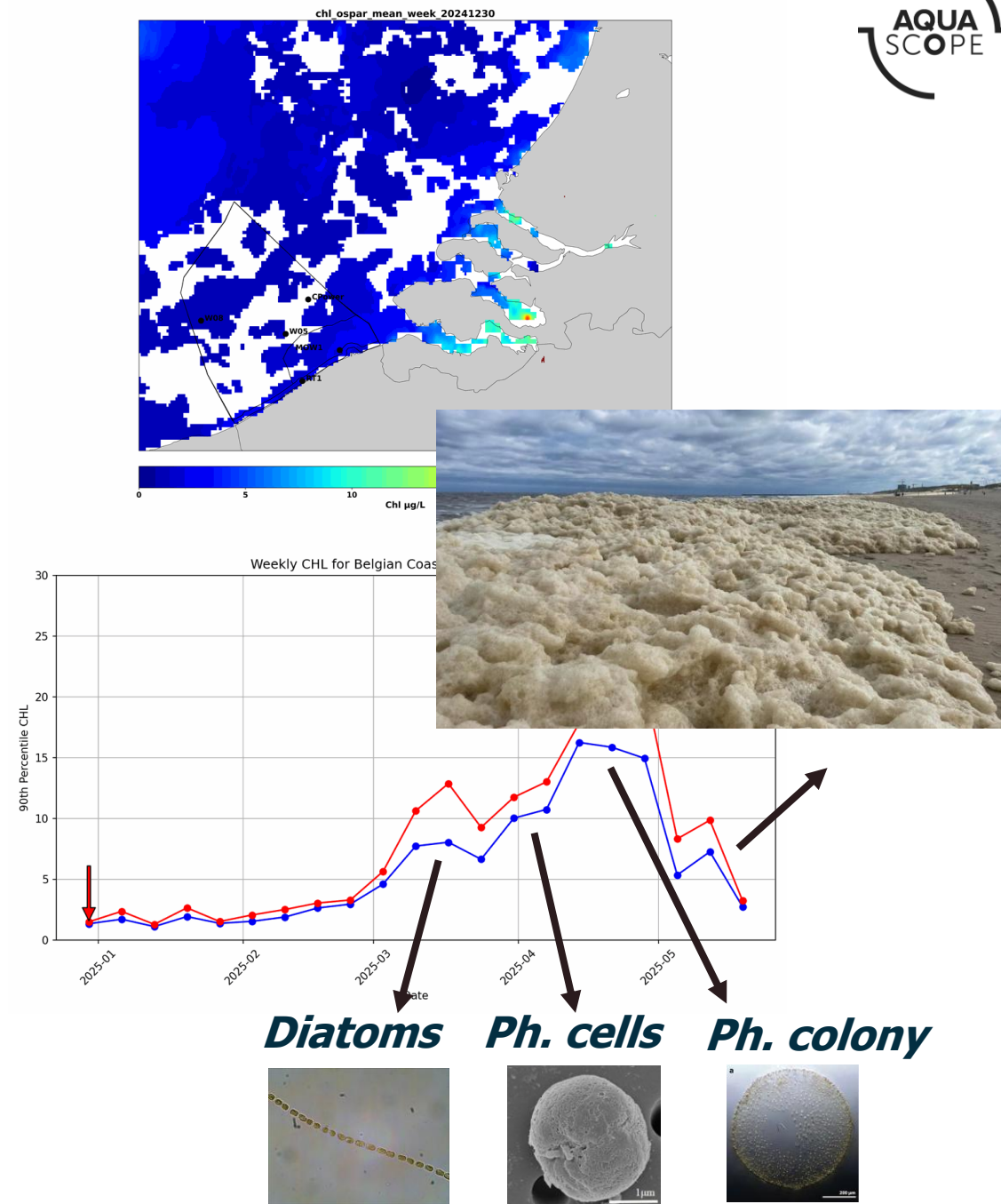


Aquatic EO data service for North Sea users

George, the Phaeocystis cell...



- 👍 **Temperature timing (4-10°C in April)**
- 👍 **High N/P nutrient ratio through river input**
- 👍 **Nutrients well mixed up to the surface**



Phaeocystis Globosa: *a nuisance/harmful species*

Foam incident in Schevening, NL, May 2020

Death of five surfers in storm shocks Netherlands

Fears more victims could be found after experienced group caught in heavy seas and thick sea foam off coast of The Hague



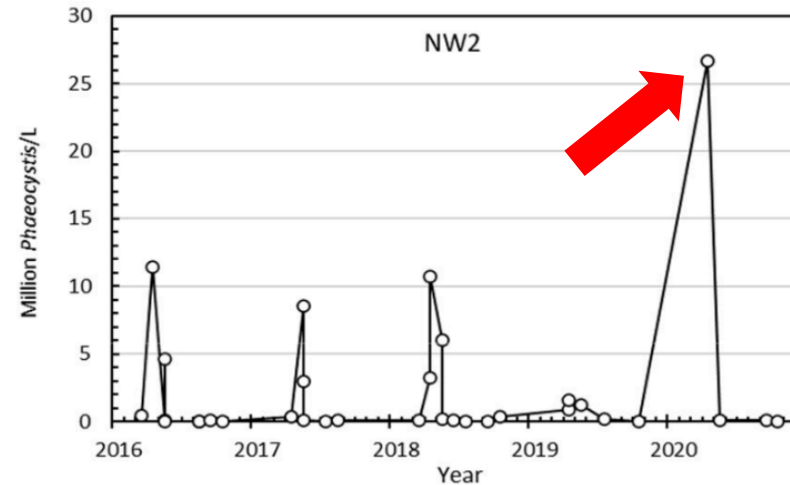
▲ Relatives, friends and the surf community gather on The Hague beach where five surfers drowned during a storm. Photograph: Pierre Crom/Getty Images



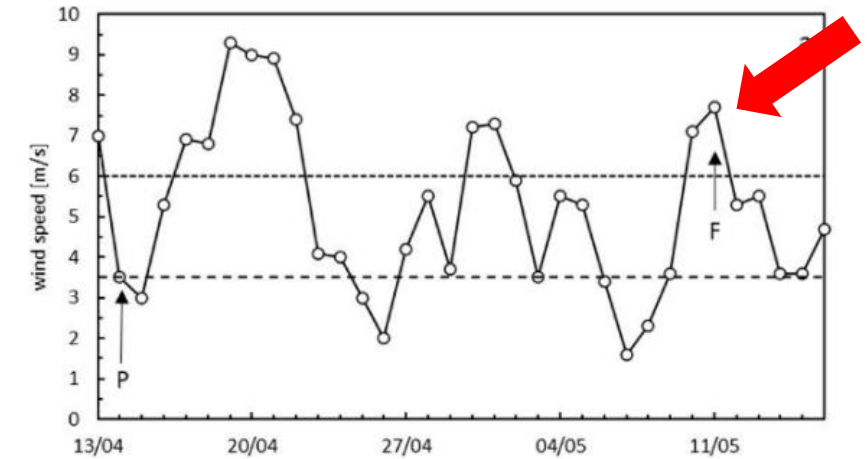
Phaeocystis Globosa: *a nuisance/harmful species*

Foam incident in Scheveningen, NL, May 2020

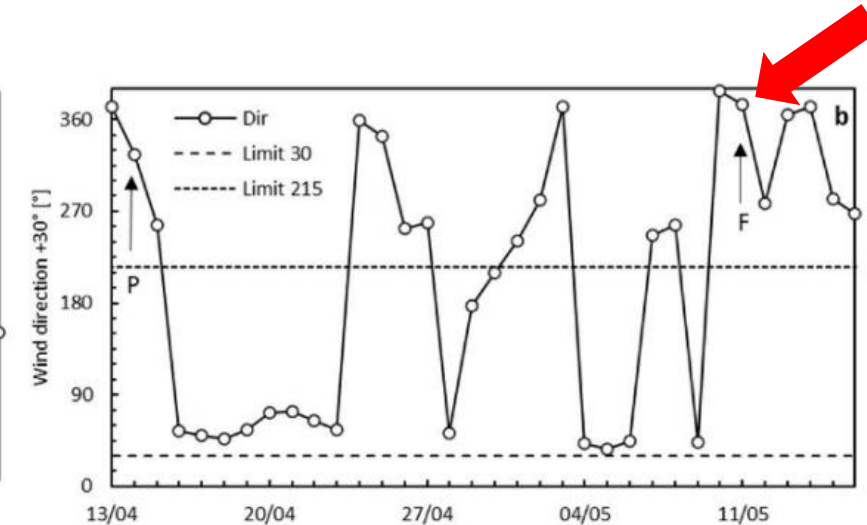
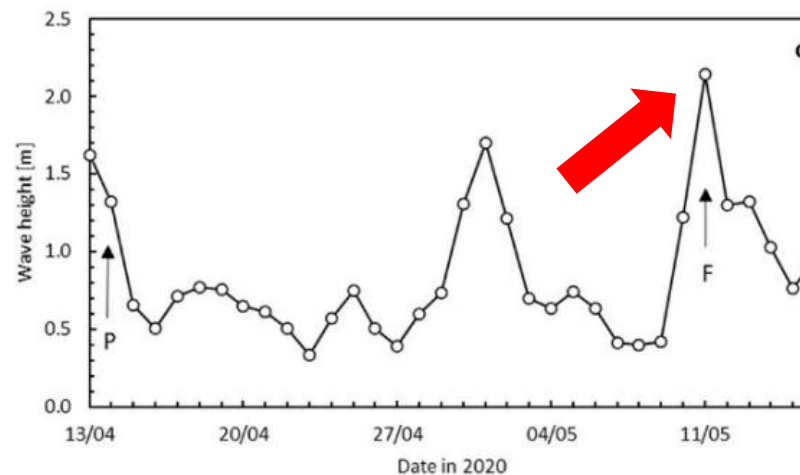
1. Preceding Phaeocystis Bloom



3. Wind speed and direction



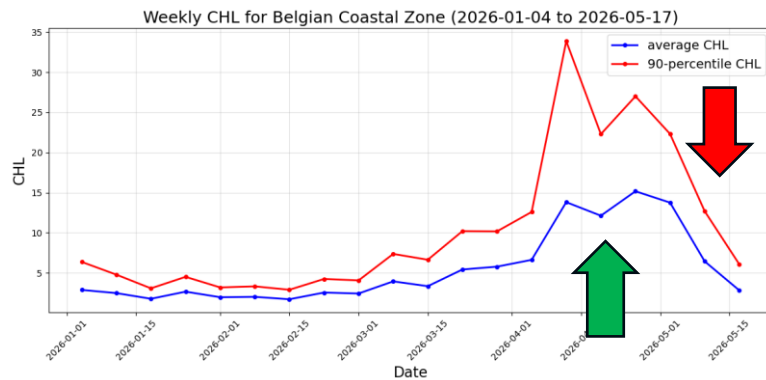
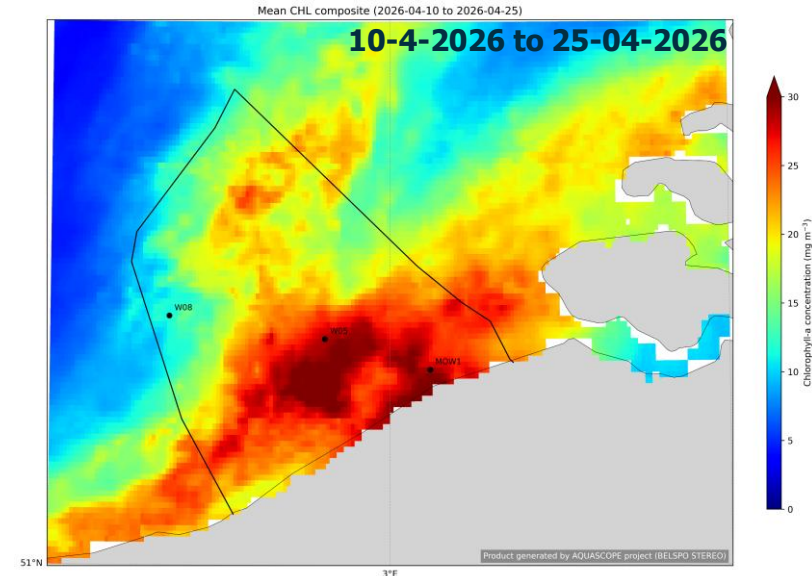
2. Increased wave height



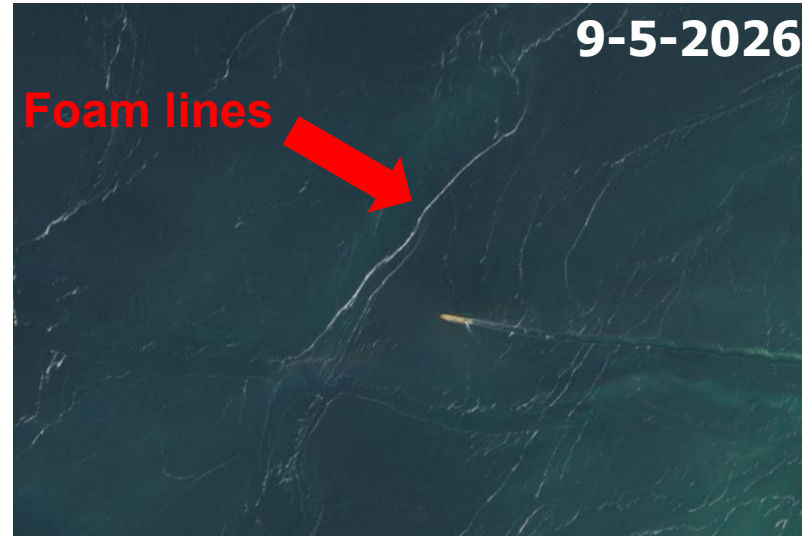
Phaeocystis Globosa: *early warning service*



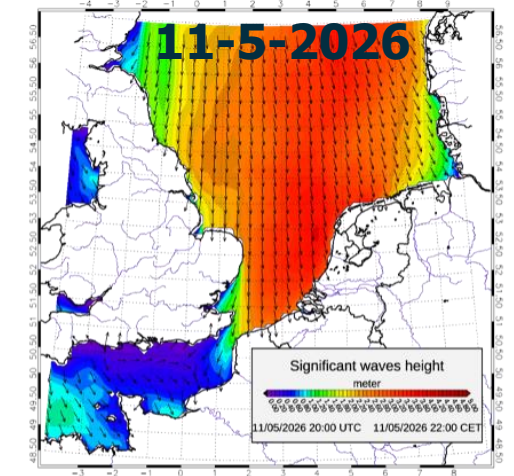
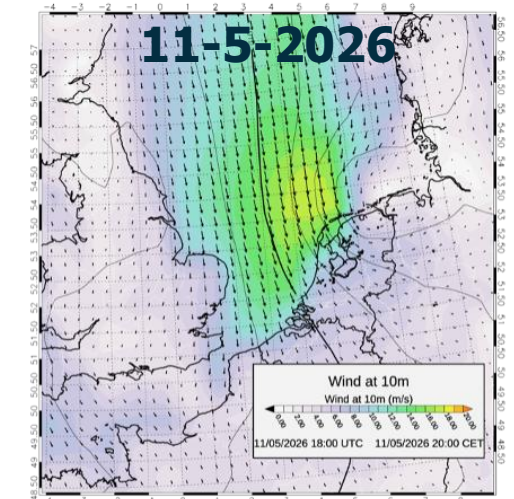
1. Preceding Phaeocystis Bloom



2. Visual inspection of HR images



3. Check wind and waves forecast



Phaeocystis Globosa: *early warning service*

Foam alert issued on
10/5/2026



Remotely Piloted Aircraft
System (RPAS) deployed on
11/5/2026



Multipurpose Maritime
Operations (MMO)



Schevening beach closed due
to foam accumulation on
11/5/2026

west
online tv radio

Voorpagina Nieuws Kijk Luister Meer

AA 🔊 📶 🌐

Metersbrede strook zeeschuim op het strand en in de zee: 'Ga het water niet in'

11 mei, 23:30 • Aangepast 12 mei, 11:18 • 2 minuten leestijd

A wide, sandy beach is completely covered by a thick, white, bubbly layer of sea foam that has washed onto the shore. The foam extends far into the distance, meeting the ocean under a cloudy sky.

Op het strand ligt een brede strook schuim
© Omroep West

DEN HAAG - 'Ga het water niet in', luidt het dringende advies. De rode vlag is gehesen bij het strand van Scheveningen. Langs het strand van Den Haag ligt dezer dagen weer volop zeeschuim. En dat precies zes jaar na het surfdrama bij Scheveningen. In 2020 kwamen vijf surfers om het leven.

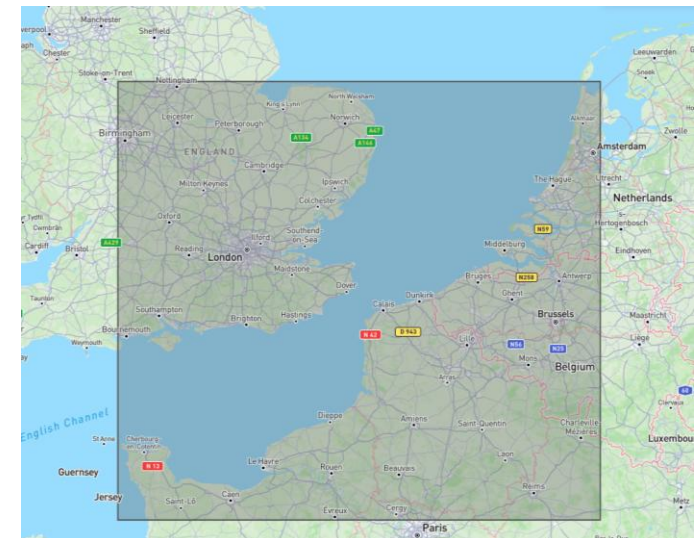
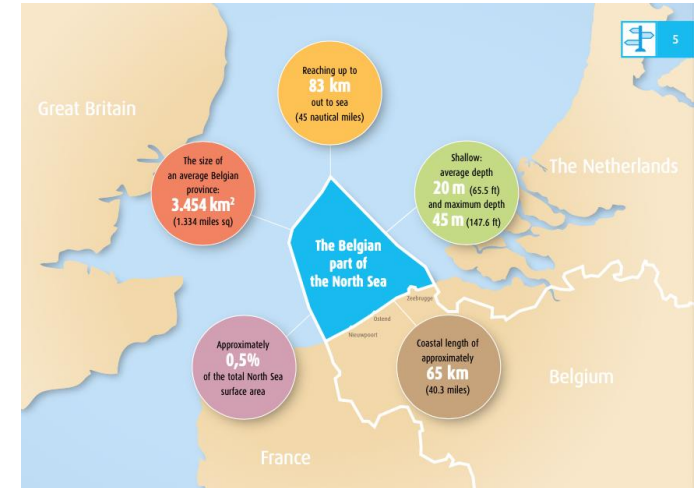


AQUASCOPE objectives

The AQUASCOPE service will **add mature aquatic products to the Terrascope portfolio** and **provide a satellite data service to Belgian North Sea users** from the Terrascope environment (satellite data archive, web viewer, EOPlaza).

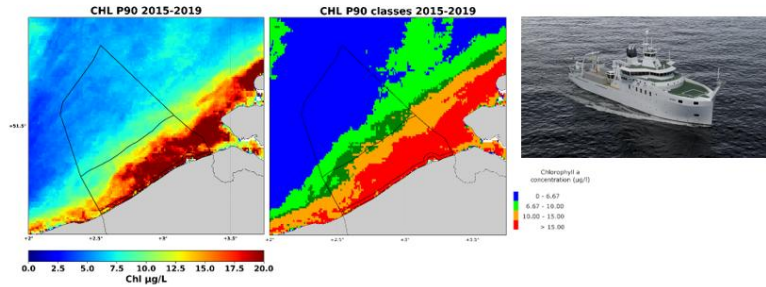
- ROI: Belgian part of the North Sea
- Spatial resolution: 10m to 500m (including fusion products)
- Sensors: Sentinel-3/OLCI/SLSTR, Sentinel-2/MSI, Landsat 8-9/OLI/TIRS
- From 2015 to Near Real Time (Latency of 24h)
- Parameters:
 - *Quasi-true colour (RGB)*
 - *Remote sensing reflectance (Rrs)*
 - *Suspended particulate Matter (SPM)*
 - *Turbidity (TUR)*
 - *Chlorophyll a (CHL)*
 - *Algal bloom detection (AB) and eutrophication assessment (EUTRO)*
 - *Sea Surface Temperature (SST)*
 - *Floating Objects/Vegetation (FO/FV)*
- *Products: L3D, L4M, L4Y and L4D (multi-resolution gap-filled)*

AQUASCOPE will perform **quality control and validation analyses** to ensure **high quality products** specifically for the Belgian North Sea (turbid, eutrophic waters).



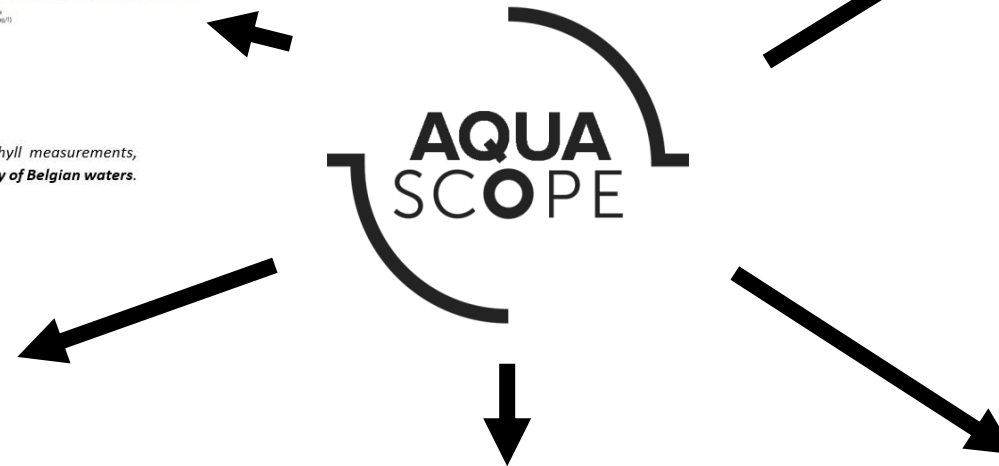
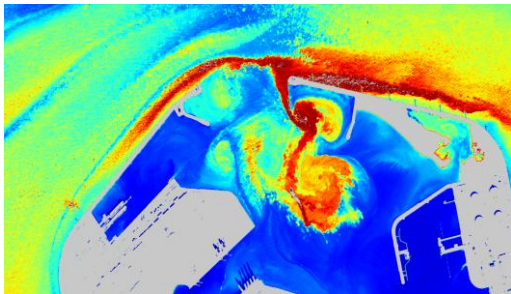
Belgian North Sea end users of EO data services

Federal Public Services responsible for reporting on the state of the North Sea to European Directives (OSPAR, MSFD, WFD)

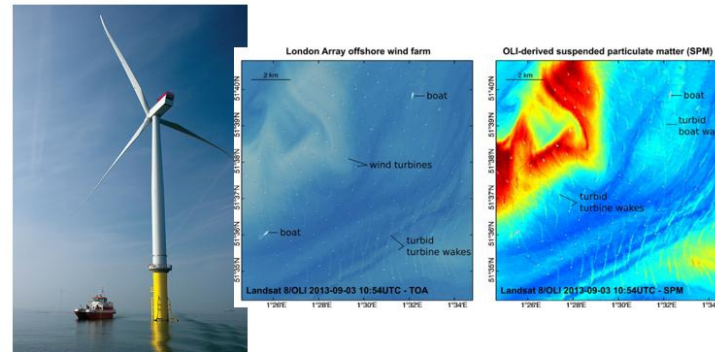


Data processing of thousands of images over 6 years (a few million chlorophyll measurements, CHL=phytoplankton) to provide a report to the European Commission on the **quality of Belgian waters**. This will be a huge support for the new Belgium!

Harbour authorities monitoring of dredging activities



Environmental impact assessments of windfarms



It was RBINS that discovered that offshore wind turbines alter sediment transport over several kilometers [... and therefore the seabed, an important piece of information for **environmental impact assessments** around the world. Here we see turbid wakes that stretch several kilometers from each wind turbine.

Universities and other scientific institutions by providing data to support research and education

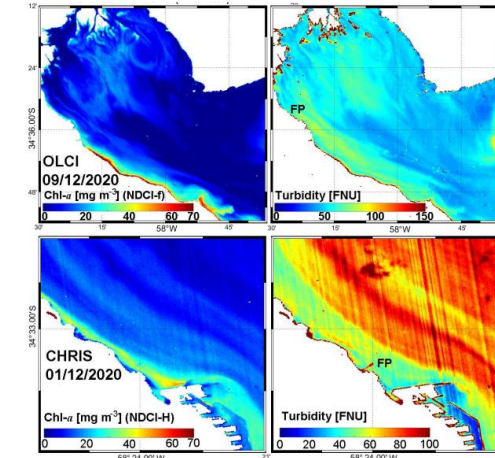


Fig. 3 S3B-OLCI (top) and CHRIS-PROBA (down) chl- a (left) and turbidity (right) maps using best fit models.

GHENT UNIVERSITY

LIÈGE université

Aquaculture sector (mapping op optimal habitat)



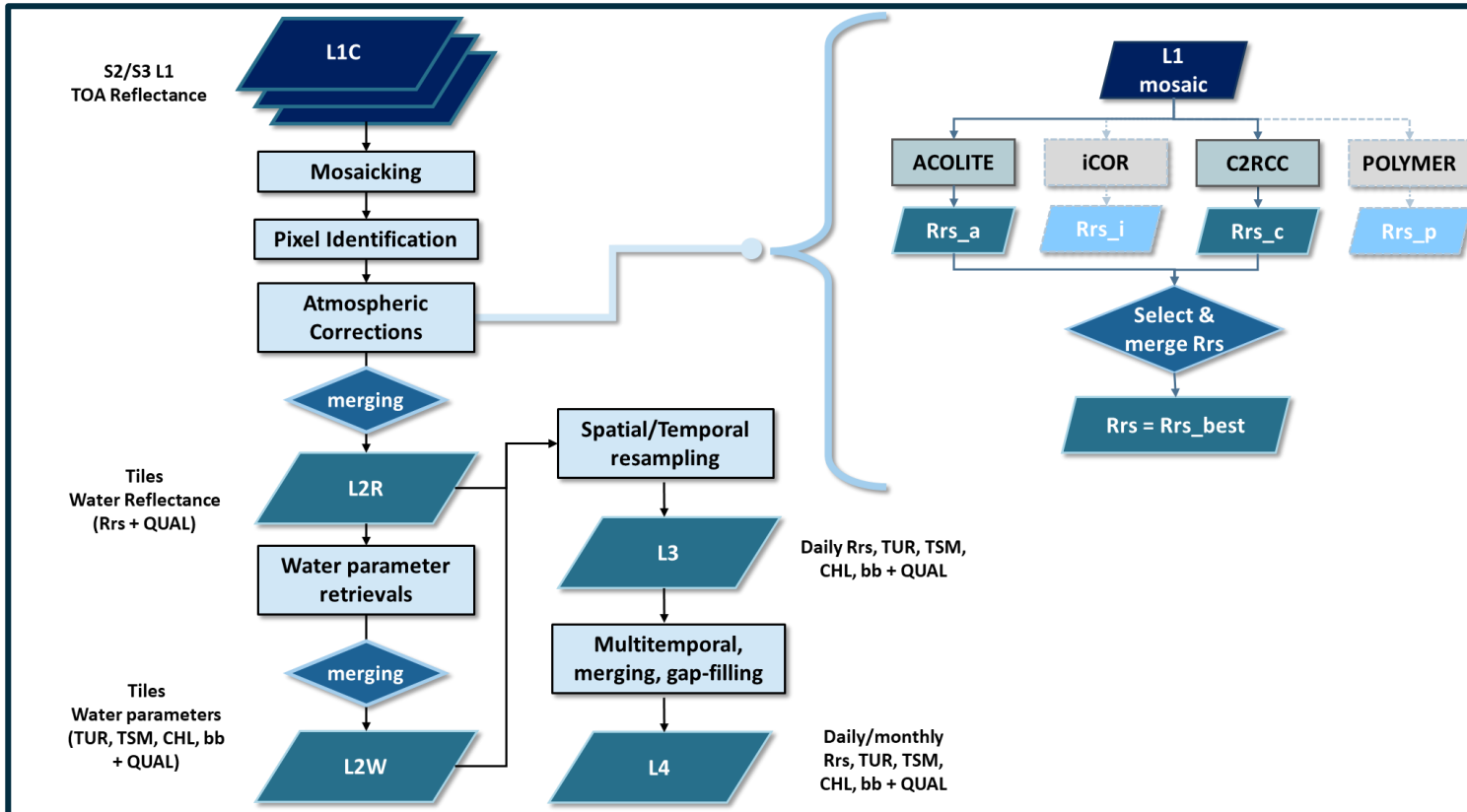
© Pictures: Gust Lesage, DEME Group

EDULIS
OFFSHORE MOSSELEWEEK
IN WINDMOLENPARKEN

AQUASCOPE processing chain

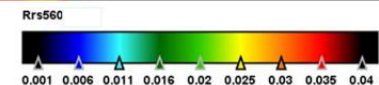
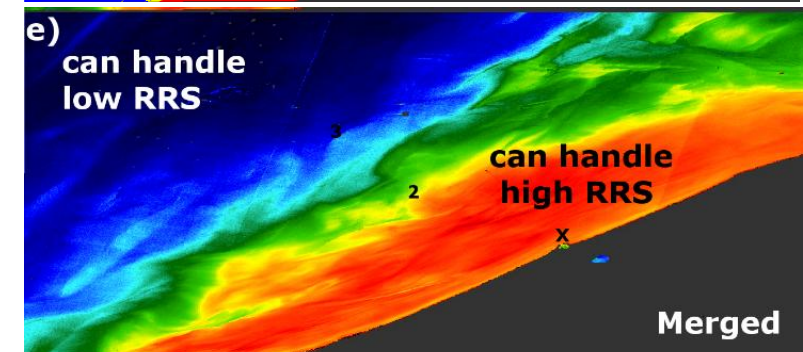
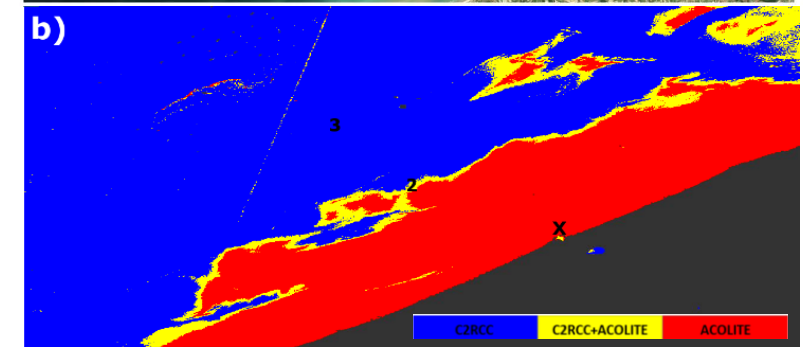
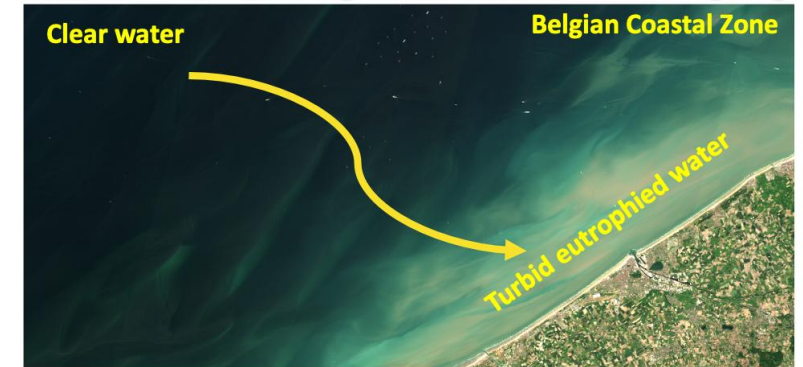
Multi-Algorithm approach

Merging algorithm approaches for atmospheric correction and in-water retrieval to address the different coastal water types of the European Seas



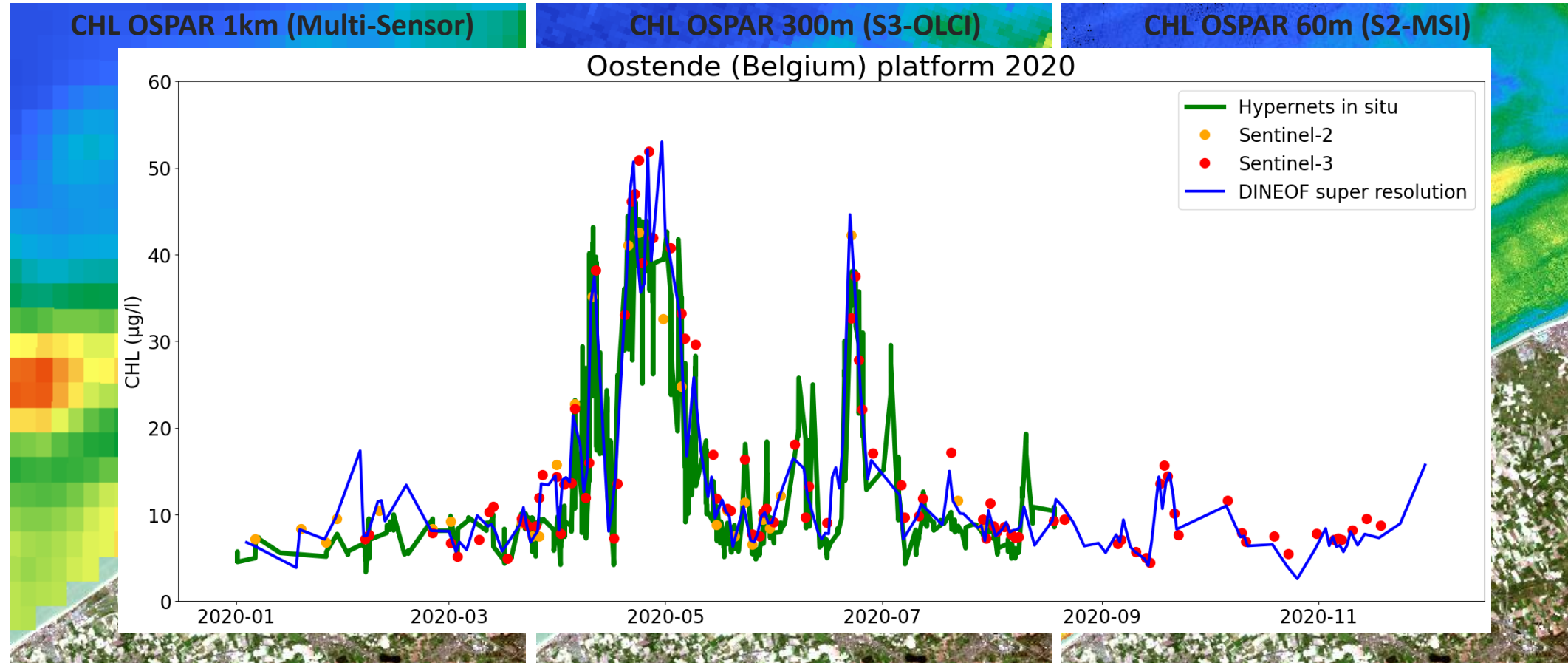
Van Der Zande, et al. (2023). Improving operational ocean color coverage using a merged atmospheric correction approach. *Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2023*. SPIE.

Remote Sensing Reflectance merging



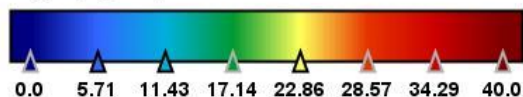
AQUASCOPE aquatic products: Chlorophyll-a

Generation of multi-resolution, daily ocean colour satellite products for coastal applications



Sentinel-2 RGB 20200405 (Oostende, BE)

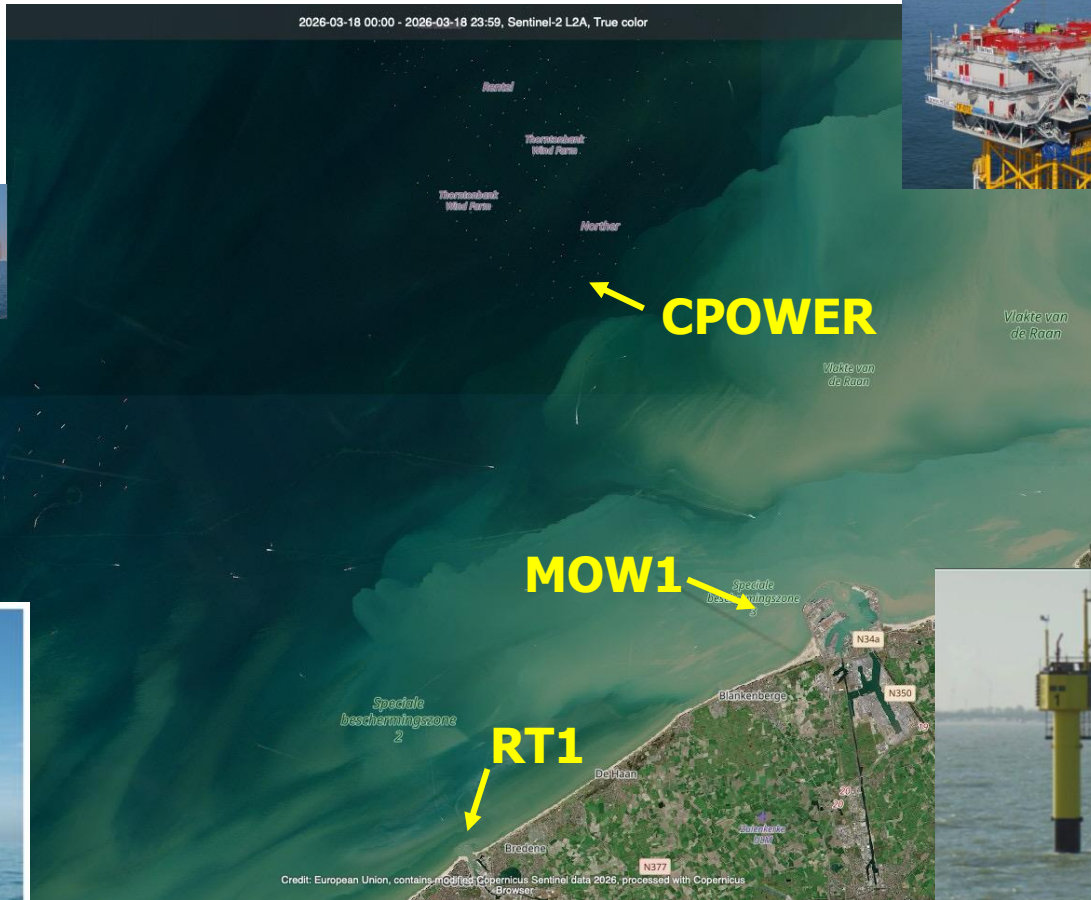
chl_ml [mg m^{-3}]



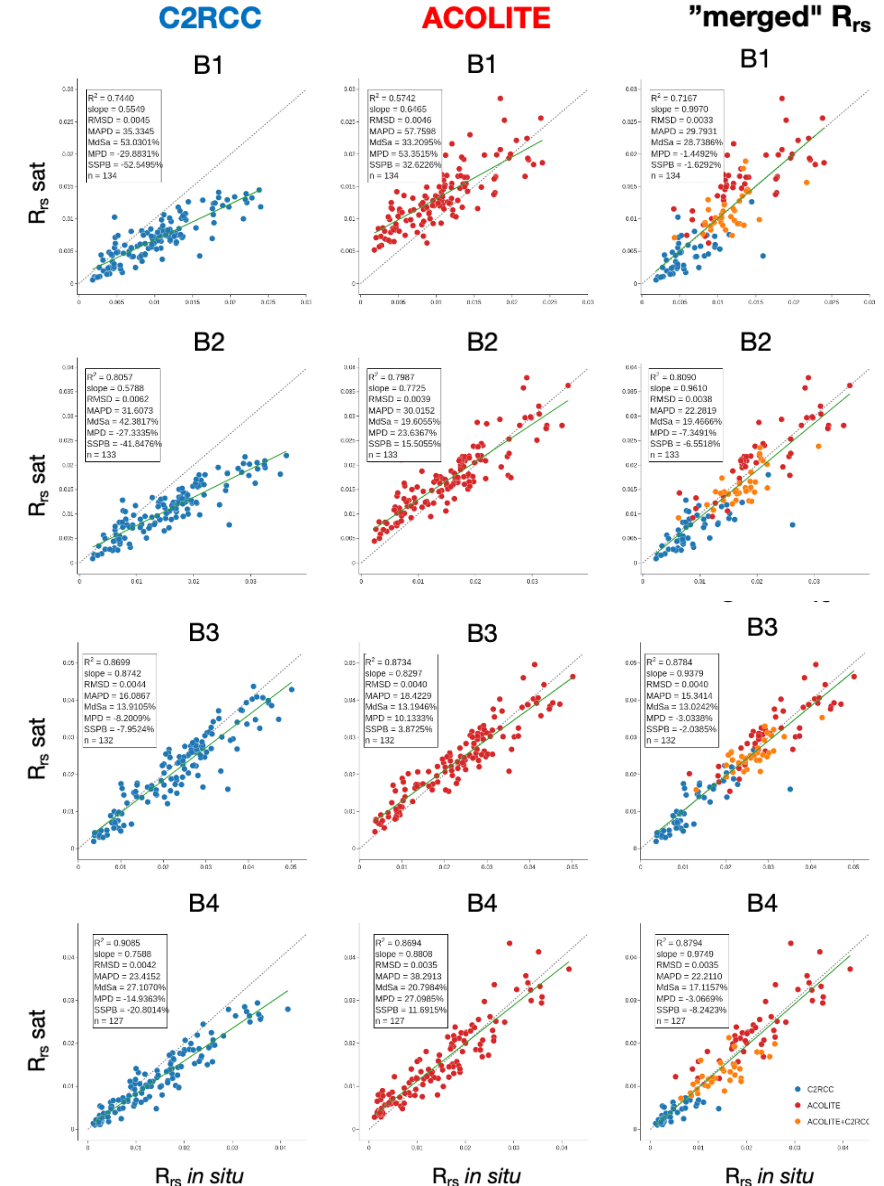
AQUASCOPE: RRS validation

WaterHypernet: 3 Belgian Stations

- Autonomous measurement of hyperspectral water reflectance
- Pan-and-tilt system + radiometer
- Oostende (RT1), Zeebrugge (MOW1), Cpower (Thornton)



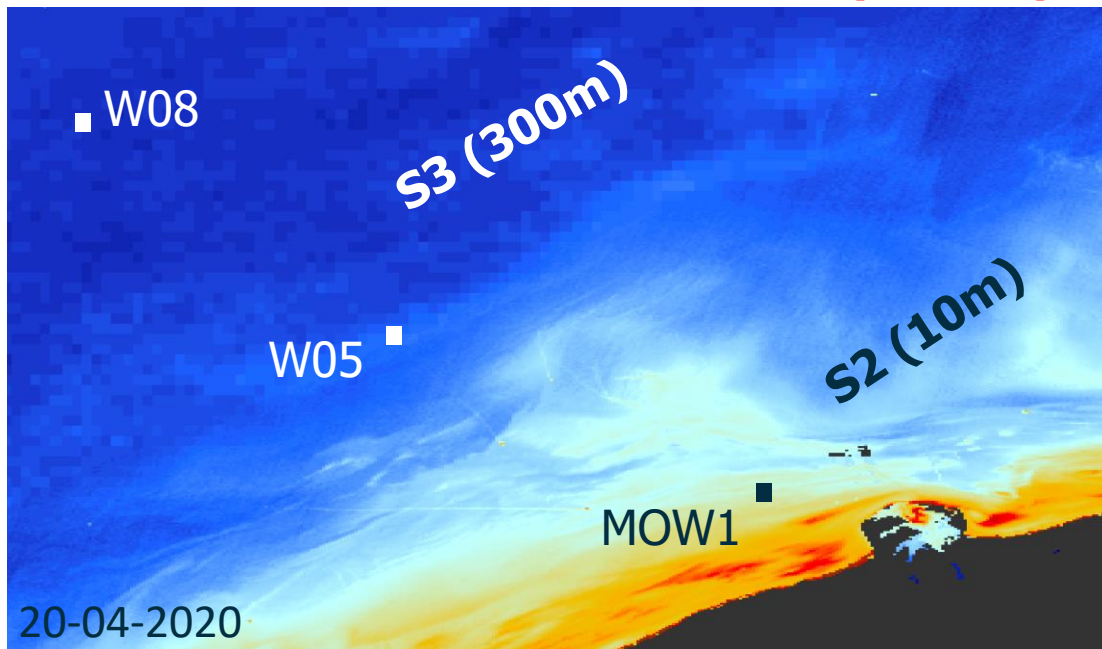
SENTINEL-2



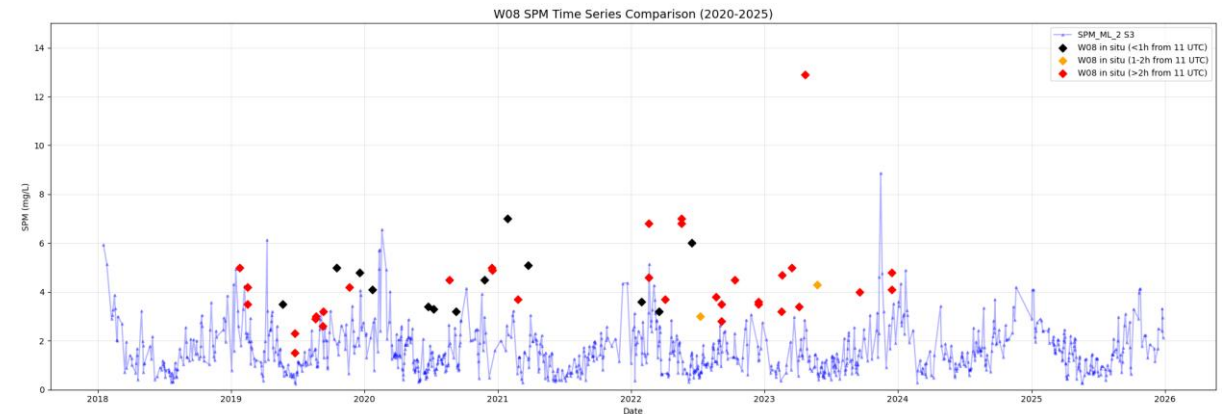
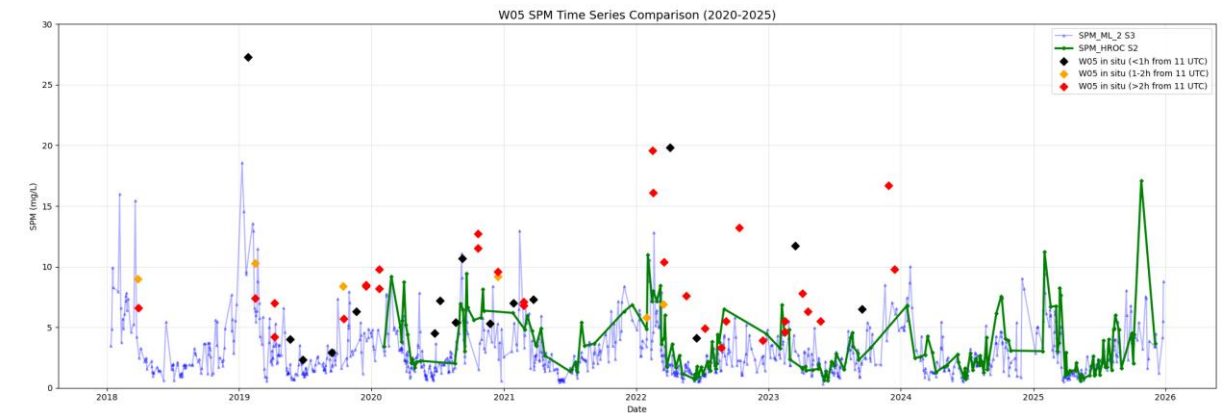
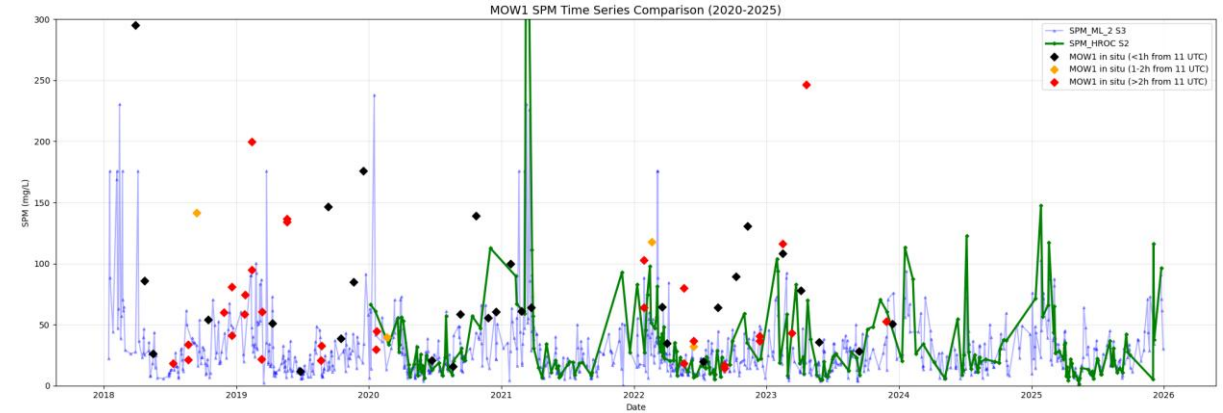
AQUASCOPE: water quality product validation



MULTI-SENSOR MERGED PRODUCT (S2 + S3)



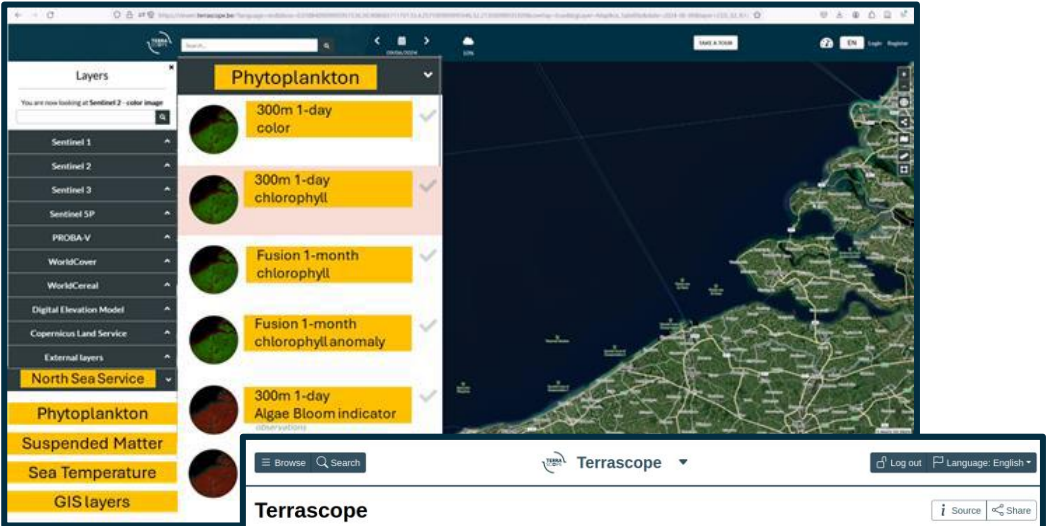
spm_mr_S2_S3_multi [g m-3]



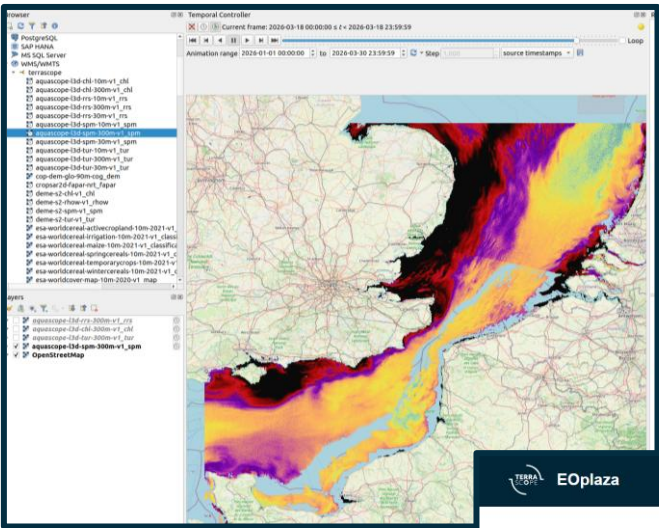
AQUASCOPE in TERRASCOPE ecosystem



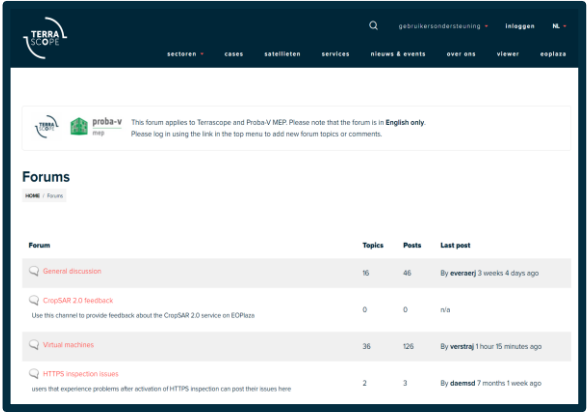
To ensure good user engagement we will take advantage of existing TERRASCOPE tools:
web viewer (i.e. TERRASCOPE viewer)



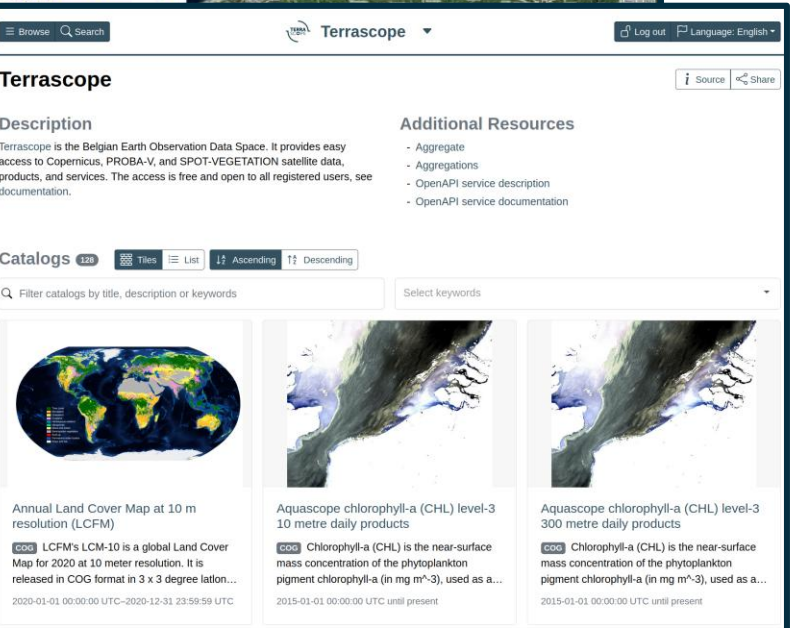
WMTS service



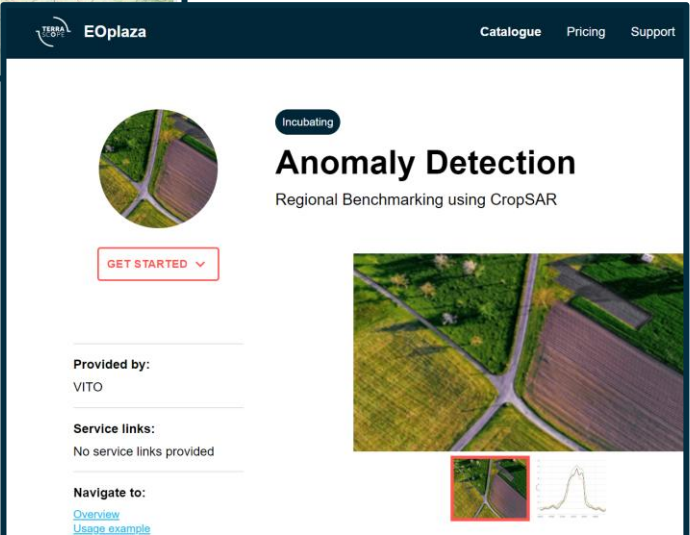
Technical Forum
+ Service desk



STAC Browser



EOplaza



Coming soon



2026

June

NRT L3D products
RRS, SPM, TUR, CHL, SST

July – August

Full archive L3D products
RRS, SPM, TUR, CHL, SST

September

Gap filled L4D products
Multi-Resolution products
CHL, SPM, TUR

October

Algal bloom detection
Eutrophication products
Foam detection
Marine heat waves

2027

End user interactions

Keep an eye on www.terrascope.be